

Heart Health = Urologic Health and Heart Unhealthy = Urologic Unhealthy: Rapid Review of Lifestyle Changes and Dietary Supplements

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• Heart • Urology • Lifestyle change • Dietary supplements

Almost all aspects of urology are affected by lifestyle changes and dietary supplements.^{1–3} Yet, putting a quick summary together of these interventions is a daunting task because some of these interventions have potential profound impacts independently or in combination with conventional therapy, others have no impact, and some could negatively affect treatment and overall health. Over the last decade, few specialties have arguably invested more energy and effort in determining whether or not certain dietary supplements affect a variety of medical conditions than urology.^{4,5} Thus, a quick review of potentially efficacious and nonefficacious lifestyle and supplemental interventions seems necessary.

BENIGN PROSTATIC HYPERPLASIA

Benign prostatic hyperplasia (BPH) or lower urinary tract symptoms have a long history of being positively affected by heart-healthy lifestyle changes. Thus, reminding patients that almost anything heart healthy is prostate healthy is a simplistic and important mantra.⁶ Conversely, heart-unhealthy changes increase the risk of exacerbation of BPH, such as

lack of exercise, obesity, excess alcohol intake, poor mental health, high cholesterol level, heart disease, hypertension, diabetes, tobacco use, and so forth, which all seem to have a potential profound impact via multiple mechanisms, including increased sympathetic tone, cholesterol, oxidative stress, and so forth.^{7–15}

β-Sitosterol and Other Cholesterol Reducers

Phytosterols are found in a variety of plants and plant oils.¹⁶ Phytosterols are similar in structure to cholesterol except for a minor structural difference. Phytosterols are not synthesized in humans and are not well absorbed, are excreted more rapidly from the liver than cholesterol, and are not found in high concentrations in human tissues. The main phytosterols found in the diet are sitosterol, stigmasterol, and campesterol. β-Sitosterol is the phytosterol found in largest quantity in the diet. Phytosterols block the uptake of exogenous cholesterol from dietary and bile sources in the intestinal tract. Low-density lipoprotein (LDL) cholesterol is reduced by phytosterols, and high-density lipoprotein (HDL) and triglycerides are not affected. The blockage of cholesterol absorption may produce a relative

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cholesterol pool reduction, which is followed by upregulation of cholesterol synthesis and LDL receptors, which can increase LDL removal. This process is similar to how some healthy dietary fats found in many healthy foods, such as almonds or pistachios, may also reduce LDL levels and improve some specific urologic outcomes.^{17,18}

More than 40 clinical trials of phytosterols have been conducted that have ranged from 1 to 12 months.^{16,19,20} Plant sterols added to foods such as yogurt, margarine, orange juice, mayonnaise, milk, and olive oil have been shown to reduce LDL level by approximately 10% to 15% (mean of 10%–11%) when approximately 2000 mg/d is ingested. About 1600 to 3000 mg of plant sterol supplemental or tablet consumption can also reduce LDL levels by approximately 4% to 15%. Plant sterols may also reduce the absorption of some fat-soluble vitamins; so, there has been some debate as to whether multivitamins should be consumed with the use of these products.

The primary mode of action of these sterols via cholesterol uptake reduction and a minor antiinflammatory mechanism suggests, in my opinion, that they are weaker mimics of the drug ezetimibe (Zetia), which can reduce LDL levels by approximately 20% with a 10-mg dose.^{21,22} Recently, laboratory research has demonstrated the ability of ezetimibe to favorably affect prostate tissue and reduce BPH.²³ Ezetimibe is commonly added to statin therapy or other lipid-lowering agents to achieve synergistic impacts and, more favorably, reduce LDL level.^{21,22} Therefore, it should not be surprising that β -sitosterol by itself or with other cholesterol-lowering medications could favorably affect BPH. For example, despite some data that suggest no impact of statins on established BPH over a short period,^{24,25} other new epidemiologic and past laboratory studies suggest potentially favorable impacts on BPH prevention and progression with cholesterol-lowering prescribed medications.^{26–28}

Two meta-analyses, performed by similar investigators in 1999 and 2000, suggested that β -sitosterol could provide some benefit for men with BPH.^{29,30} In some of these studies, β -sitosterol is an extract that contains a variety of phytosterols or plant sterols that are usually derived from the South African star grass (*Hypoxis rooperi*). Researchers reported an impressive mean difference compared with placebo; the International Prostate Symptom Score was -4.9 points, peak urinary flow rate was 3.91 mL/s, and residual volume was -28.62 mL. β -Sitosterol did not affect prostate size, which is of interest because there is some preliminary evidence that it may mildly inhibit 5α -reductase.³¹ The withdrawal rates were similar to those of placebo (approximately 8%). Most common side effects

with β -sitosterol were gastrointestinal side effects in 1.6% and erectile dysfunction in 0.5%. These analyses were conducted from 4 trials that involved 519 men. The question is to why not try β -sitosterol, a heart health ingredient, with or without medications for BPH. The dosage range in these studies has been from 0.30 mg of β -sitosterol- β -D-glucoside to approximately 200 mg/d. However, the dosage recommended in cholesterol treatment guidelines is 2000 to 3000 mg a day to reduce LDL by 6% to 15%, and, in fact, these National Cholesterol Education Panel recommendations state that “Plant stanol/sterol esters (2 g/day) are a therapeutic option to enhance LDL cholesterol lowering.”³² However, no recent studies of β -sitosterol have been published, but, if a patient is going to use a cost-effective product for cholesterol reduction, it is theoretically possible that a secondary benefit may be prevention or reduction in some aspect of BPH.

A 2002 meta-analysis of 18 *Pygeum africanum* clinical trials suggested a potential benefit with this supplement.³³ These compounds are an extract of the African prune tree. The mean duration of clinical studies was 64 days, but men were more than 2 times as likely to report an improvement in overall symptoms; nocturia was reduced by 19%, residual volume was reduced by 24%, and peak urine flow was increased by 23%. The withdrawal rate was similar to placebo at 12%. Adverse effects were similar to those of placebo, and the most frequently reported adverse effects were gastrointestinal. Most studies used a standardized extract effective at approximately 100 to 200 mg/d. One of the main components of *Pygeum africanum* and saw palmetto are phytosterols that include β -sitosterol.^{34,35} However, the problem with *Pygeum* is demand compared with precious supply, in that the bark is derived from an endangered tree.³⁶ This is not the case with saw palmetto, which seems to be in abundance and has arguably a diverse number of heart-healthy compounds beyond β -sitosterol, including the primary mono-unsaturated fat found in olive oil (oleic acid) and a variety of other potentially healthy dietary fats that may have the ability to increase HDL levels and lower cardiovascular events.^{37–40}

CHRONIC NONBACTERIAL PROSTATITIS AND INTERSTITIAL CYSTITIS

Dietary supplements in chronic nonbacterial prostatitis and interstitial cystitis are actually fairly well known and have a history of being heart healthy, and some even reduce blood pressure in prehypertensive patients.^{41–45} Less known is that there is a history of some heart-healthy lifestyle changes that have also displayed some preliminary profound effects.

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